

to have occurred in northern and inland areas a little earlier than in southern and coastal areas.

Although large populations were reported for a fairly long period that during which most massed unidirectional flights were recorded was relatively short (first half of November) and these flights took place almost simultaneously over much of eastern Australia with a peak occurrence from about 9th-15th November.

A second remarkable feature of the flights is the variety of their directions. Reports include virtually all directions and simultaneously very different directions were reported for localities quite close to one another (e.g. in some Sydney suburbs such as Ryde and Turramurra the directions were S and WSW respectively for the same period on the same day). It must be concluded from this that the flights involved local populations over relatively short distances or that directional changes of the moving populations were frequent and taking place at more or less fixed points on the route of flight. As the flow of populations past a single point continued for a considerable time it must be concluded that the latter is the more likely explanation for the difference in flight directions at nearby localities. Such flight direction changes are known in other migrant Lepidoptera e.g. *Danaus plexippus* (L.) and some African Pierids.

It can be concluded that *N. amica* is a species in which massed, unidirectional population movements take place under certain circumstances and it seems likely that owing to the complexity of the flight pattern the movements can be detected clearly only in years of exceptional abundance.

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## A NOTE ON APPARENT OVIPOSITION BEHAVIOUR IN A BOMBYLIID FLY (DIPTERA)

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Despite the abundance and diversity of Bombyliidae in Australia, extraordinarily little is known of their larval biology. The few facts then known were summarised by Roberts (1928a: 92), and a few other records were added in the course of his revision of the family (Roberts 1928a, b; 1929). A very brief summary was given by Colless and McAlpine (1970), to which I can now add records of two undescribed species of *Cyrtomorpha* (held in the Aust. National Insect Collection) reared from grasshopper egg-pods; also, of several larvae, possibly of Bombyliidae, found in tunnels made by Hymenoptera

(probably bees) in the walls of a termite mound. It is strange, though, that we seem to know precisely nothing about the large subfamilies Lomatinae and Bombyliinae that make up the bulk of our fauna.

It therefore seems worth placing on record an observed case of apparent oviposition behaviour in a bombyliine. The specimen concerned is golden haired, with pale legs, and of medium size (wing length 6.6 mm); it keys to the genus *Anastoechus* Osten-Sacken, but is not identifiable with any of the known species in that genus, or in the related *Systoechus*, as reviewed by Roberts (1928b). It can be mentioned, too, that Dr John Bowden (in litt.) has reservations as to whether the genus *Anastoechus* is really represented in this country.

The behaviour was observed, and the specimen later captured, on 23rd April, 1976, at the foot of the Bukalara Plateau, N.T., a few kilometres east of the Mimets Co. mine on the McArthur River. The fly was first located by its characteristic, high-pitched buzz, and then seen to be hovering close to the ground beneath the slight overhang of a large sandstone block. As is common in such sites, the floor of the overhang consisted of a very fine, almost white sand, heavily pitted with the craters of ant-lions.

What caught the attention was that the fly (later found to be a female) was slowly circling the rim of a crater, while the strong downdraught of her rapidly-vibrating wings sent a fine spray of sand tumbling down, slowly but steadily filling the crater. Moreover, after what was perhaps one or two minutes, she alighted on the rim, dabbed the end of her abdomen in the sand several times in a manner strongly suggesting oviposition, and then continued as before to demolish the crater. The "oviposition" act was repeated a few minutes later; and, finally, little trace remained of the crater, whose occupant (if there was one) did not reveal its presence during the entire proceedings. Before capture (since time was passing), the fly managed to partly demolish two other craters, alternating from one to the other, but alighting only once. On later examination, her ovipositor was seen to be slightly extruded and had numerous sand grains adhering to it.

One cannot make too much of a single, casual observation, but it is hard to attribute such behaviour to anything other than oviposition. In addition, it would be completely consistent with a mechanism for introducing an egg, or a rapidly-hatching larva, into the near vicinity of a carnivorous host without endangering either mother or offspring. Roberts (1928a: 137) records the rearing of *Anthrax confluens* Rob. from 'the cocoon of a Myrmeleontid'. This is somewhat surprising in view of the apparent predilection of that genus for wasps' nests; but it at least demonstrates the feasibility of parasitising such a host.

Seeing little chance of following up this observation, I offer it in the hope that someone else may do so, and perhaps help fill a glaring gap in our knowledge.

#### References

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